Re-examining the binding conditions of Mandarin anaphor *ziji* in the light of inanimacy

1. **Goal** - The goal of this paper is to establish the existence of inanimate *ziji* and use it as a tool for re-examining the binding conditions of Mandarin anaphors (see Charnavel and Sportiche’s 2016 inanimacy strategy). In particular, some specific properties standardly attributed to *ziji*, such as subject orientation or sensitivity to sub-command (Tang 1989, a.o.), could either be an artefact of logophoricity or intrinsic properties of *ziji*. The examination of inanimate *ziji*, which cannot be logophoric as it lacks a mental state, allows us to shed new light on these issues.

2. **Binding properties of *ziji***

   a) **Binding domain** - Like other anaphors (Icelandic *sig*, see Maling 1984, a.o.; English *himself*, see Pollard & Sag 1992, a.o.; French *son propre*, see Charnavel & Sportiche 2016, a.o.), the binding behavior of *ziji* is complicated by its sensitivity to logophoricity: *ziji* is exempt from Condition A when logophorically interpreted, i.e. when antecedent by a perspective center (Huang & Liu 2001, a.o., who refute the hypothesis that *ziji* is a long distance anaphor, cf. Cole et al. 1990, a.o.). Given that the criteria for logophoricity remain unclear, it is difficult to determine the binding domain of *ziji*. The compound anaphor *ta-ziji* has been used instead to this end, because unlike *ziji*, it is standardly considered as a strictly local anaphor based on examples like (1) (Huang & Tang 1991).

   (1) *Zhangsan, renwei Lisi k hai-le ziji / ta-ziji*. ‘Zhangsan, thought that Lisi hurt him.’

   In particular, the *ta-ziji* diagnostic shows that the subject position of an embedded clause counts as local as shown in (2) (Huang et al. 2009); this is predicted by Chomsky (1986), but not by Charnavel & Sportiche (2016) who claim that a (French) anaphor must be bound within its smallest TP.

   (2) *Zhangsan, zong yiwei ta-ziji, zui liao buqi*. ‘Zhangsan, always thinks he, is the greatest.’

   However, Pan (1998) shows that *ta-ziji* can in fact be long distance bound just like *ziji*, if there is no intervening animate as in (3) (see also Dillon et al. 2015); Pan further argues that long distance *ta-ziji* need not be contrastive, and is therefore not an instance of the intensifier *ta-ziji*.

   (3) *Zhangsan, shuo naben shu fang zai ta-ziji, de jiaji*. ‘Zhangsan, said that book was put at his, home.’

   This questions the definition of the binding domain of Mandarin anaphors, since both *ta-ziji* and *ziji* can in fact escape Condition A, presumably under perspectival conditions that are not well defined.

   b) **Sub-command** - Moreover, *ziji* (and *ta-ziji*) is claimed to exhibit a specific property as compared to other anaphors: the antecedent can sub-command it, i.e. it does not have to c-command *ziji*, but can be the specifier of a larger DP that does, if that DP is inanimate (Tang 1989, Huang & Liu 2001, a.o.).

   (4) *Zhangsan, de jiao’ao hai-le ziji*. ‘Zhangsan, ’s arrogance harmed him.’

   But it is not clear whether *ziji* is indeed sub-commanded by *Zhangsan* in (4) - thus following a version of Condition A specific to Mandarin - or whether *ziji* is exempt from Condition A because the noun arrogance makes Zhangsan a perspective center in referring to his mental state.

   c) **Subject orientation** - Another purported property of *ziji* – allegedly shared with other anaphors like Icelandic *sig* – is that it must be antecedent by a subject, as illustrated in (5) (Huang et al. 2009).

   (5) *Zhangsan, yijing tongzhi Lisi, ziji de fenshu le*. ‘Zhangsan, already told Lisi, his grade.’

   But examples like (6) (as well as the possibility of sub-command) challenge this claim: the apparent subject orientation of *ziji* could in fact be due to the fact that logophoric centers are usually subjects.

   (6) *Ziji de xiaohai mei de jiang de xiaoxi shi Lisi, hen shangxin*. ‘The news that his child didn’t win the prize made Lisi, very sad.’ (Huang & Liu 2001)

   Given that inanimates lack a mental state, all these properties can crucially be examined independently of logophoricity by studying inanimate *ziji*: this is the goal of our experimental study.

3. **Our experimental study of inanimate *ziji***

   To investigate the behavior of inanimate *ziji* (excluding near animates like *company* or *supermarket*), we set up an online questionnaire on Qualtrics: 56 native speakers of Mandarin were asked to provide grammaticality judgments about 48 sentences on a Likert scale from 1 (unnatural) to 6 (natural). We manipulated both (i) the distance between the antecedent and the anaphor, and (ii) the structural relation between the antecedent and the anaphor, by varying the position of the antecedent [(a) (within) subject; (b) (within) object] and the position of the anaphor [(a) (within) object of the same clause; (b) (within) object of a subordinate clause; (c) (within) object of a subordinate clause].
4 - Results and theoretical consequences - Our survey first demonstrates that the reflexive ziji can be inanimate as in (7) (the score out of 6 is indicated in brackets) contrary to the standard claim that the anaphor ziji (vs. the intensifier ziji) is only animate (see Tang 1989, a.o.).

(7) [Zhe ge shengwu xitong], neng zhichi ziji, de nengliang gongji.

‘This biological system, can support its, own energy supply.’

a) Subject orientation - Our results also confirm the subject orientation of ziji independently of logophoricity: the contrast between the scores in the subject condition (mean=4.37) illustrated in (7) and in the object condition exemplified in (8) (mean=1.78) is significant (p<0.001). This means that non-logophoric ziji has to be anteceded by a subject, but logophoric ziji does not have to, as in (6).

(8) *Zhangsan cuo ba wenzhang, fagei le ziji, de zuoze.

‘Zhangsan sent [the article], to its, own author by mistake.’

b) Subcommand – The study also shows that there is a significant difference (p<0.001) between a c-commanding antecedent as in (7) and a sub-commanding antecedent as in (9) (mean=3.37).

(9) *[Zhe ke shu], de guoshi ya wan le ziji. ‘The fruits of [this tree], bent it.’

This strongly suggests that subcommand is in fact an artefact of logophoricity: Zhangsan can antecede ziji in (4) not because it sub-commands it, but because it is logophoric and thus exempts ziji from Condition A. This also explains why (10) is deviant: ziji is not logophoric since failure (vs. arrogance in 4) does not make reference to the antecedent’s mental state. Moreover, the allegedly required inanimacy of the sub-commanding DP follows: an animate DP (e.g. Zhangsan’s mother vs. Zhangsan’s arrogance) is an intervening logophoric center (cf. Xue et al 1994).

(10) *Zhangsan, de shibai biaoshi tamen dui ziji, mei xinxin.

‘Zhangsan,‘s failure indicates that they have no confidence in him.’ (Huang & Liu 2001)

c) Binding domain – Finally, our results show that ziji anteceded by a matrix subject behaves like a locally bound anaphor when it is within the subject of an embedded clause as in (11) (mean=3.94), but not when it is outside its object as in (12) (mean=2.09): while the difference between these two conditions is significant (p<0.001), that between the conditions in (11) and in (7) is not (p=0.13).

(11) [Zhe xiang yanjiu], jiashe ziji, de jieguo buhui dui huanjing zaocheng fumian yingxiang.

‘This research’, assumes that its, own result won’t make negative influence on the environment.’

(12) *[Zhe ba sunhui de suo], zhengming youren qitu qiao kai ziji,

‘This broken lock], proves that somebody tried to pry into it.’

This seems to support Chomsky’s (1986) theory over Charnavel & Sportiche (2016)’s. Another possibility is to suppose that subjects in Mandarin occupy a higher position in the left periphery than in French so that an embedded subject in Mandarin (vs. French) belongs to the domain of a matrix subject. A sentence like (13) (Huang & Tang 1991) could hint that topic is a possible candidate for that position, since the allegedly local anaphor ta-ziji is acceptable in that position when anteceded by the matrix subject. But the long distance behavior of ta-ziji in sentences like (3) and the unacceptability of topikalized inanimate ziji in (14) question this hypothesis and call for further research on this issue.

(13) Zhangsan, shuo, ta-ziji, Lisi chang piping. ‘Zhangsan, said that himself, Lisi often criticized.’

(14) *[Zhe ba sunhui de suo], zhengming ziji, youren qitu qiao kai.

‘[This broken lock], proves that itself, somebody tried to pry into.’

In sum, our experimental study shows that inanimate ziji can be used as a new tool for investigating the binding conditions of ziji. Its behavior confirms the standardly assumed binding domain of ziji (in particular, Tensed-S Condition can be violated in Mandarin, and reveals that subcommand is an artefact of logophoricity while subject orientation is independent from it.